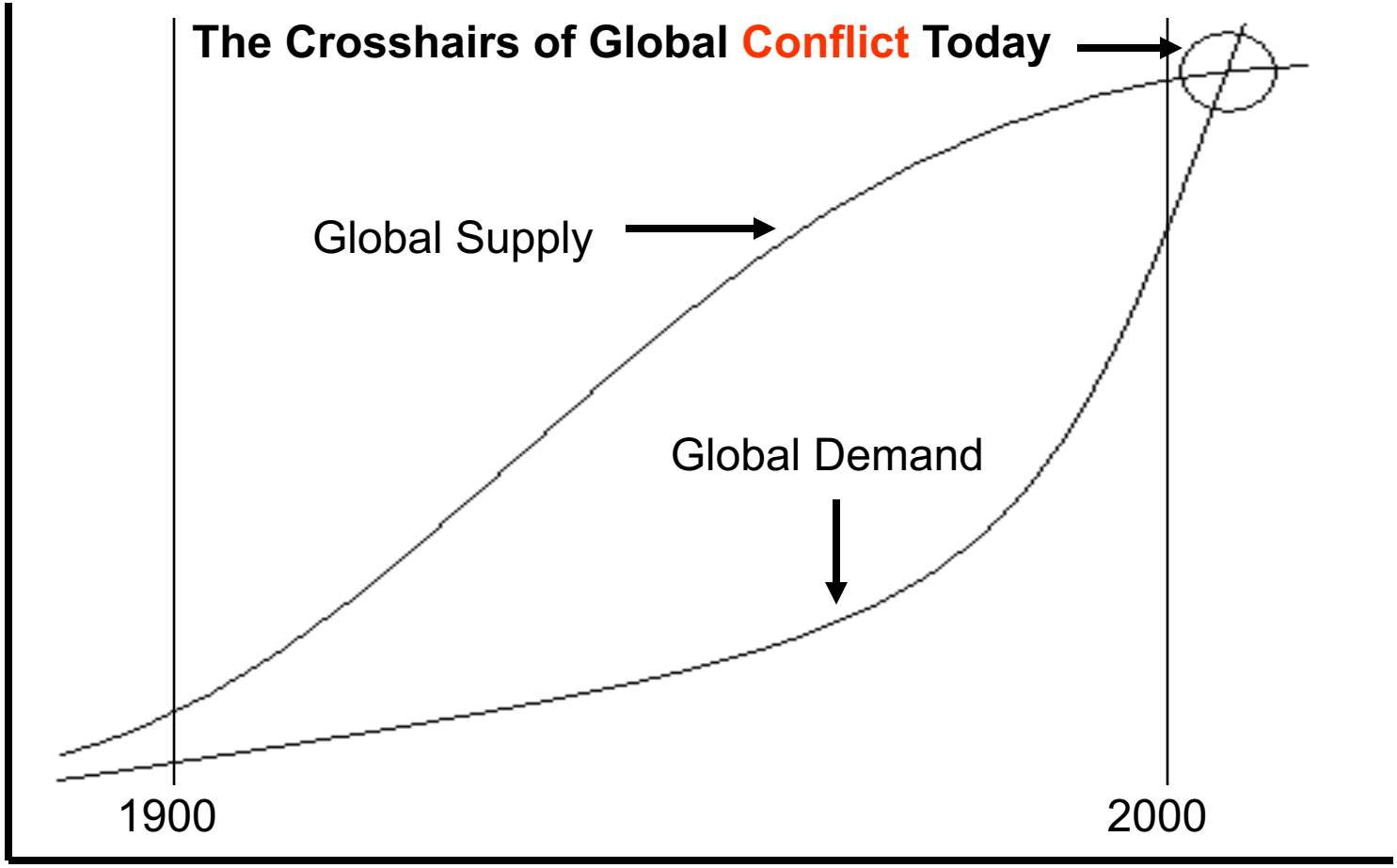
Environmental Stress and Conflict on Earth Today

Prepared for the 18th Nobel Peace Prize Forum

At Luther College in Decorah, Iowa

March 11, 2006

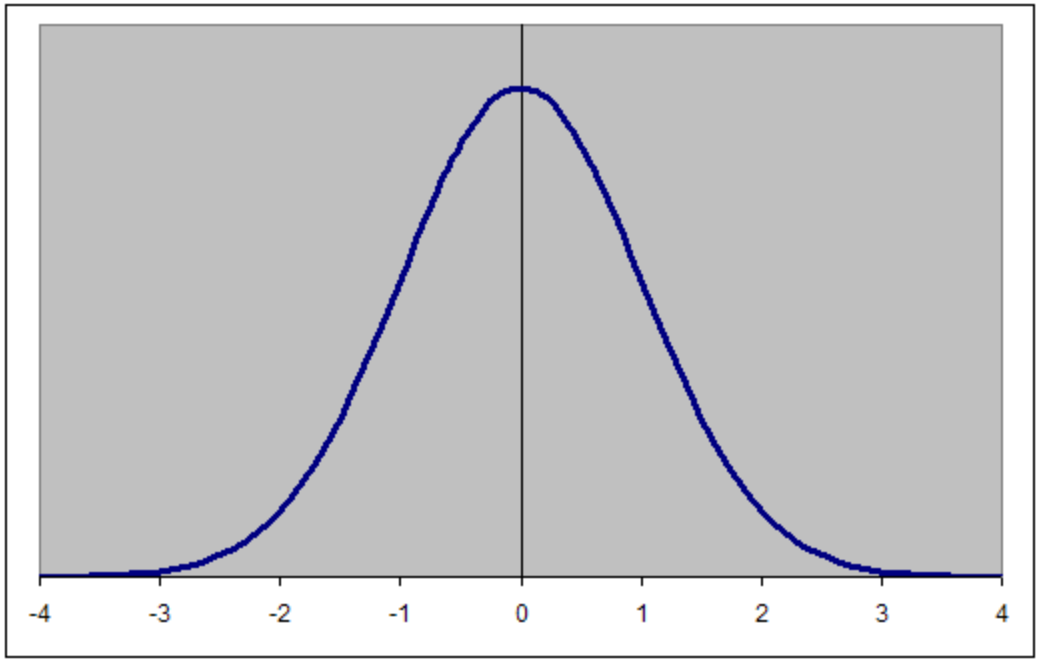
The Simplest Description of the Problem



20th Century Global Supply and Demand Curves

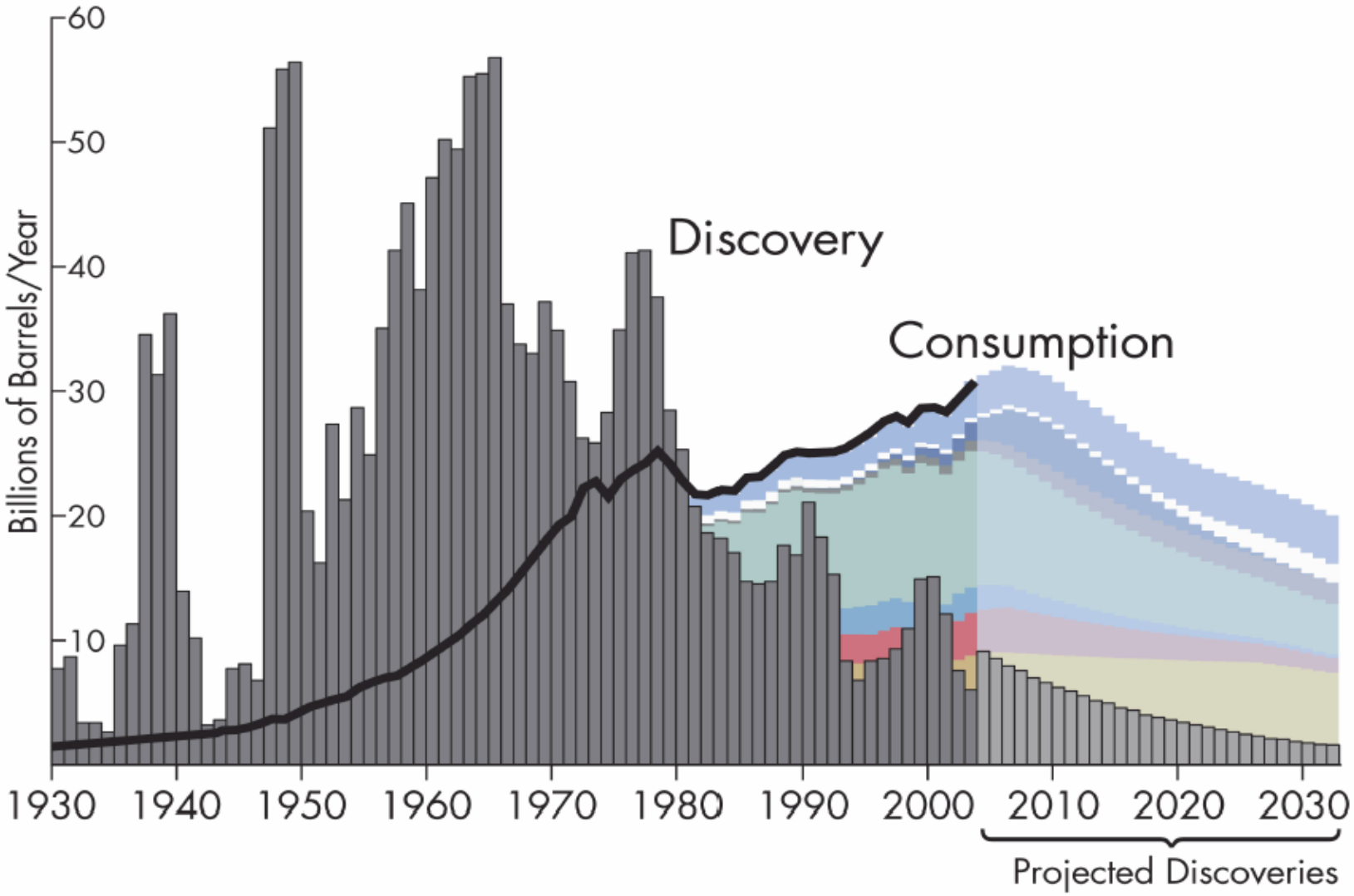
Hubbert's Famous Curve

- In 1949 Shell Oil geologist M. King Hubbert correctly predicted the peak of US oil production in 1979. His methodology was intuitively clear and shockingly accurate.



Global Oil Production is now peaking, and the downside will be **much** more expensive, and, more importantly for this talk, **stressful**. Global conflicts over oil will be severe.

Peak Oil – The Growing Gap



Common **Energy Ratios**

(a.k.a. energy gain over energy used)

- 50.0 Hydroelectric* (also high **quality**)
- 15-45 Nuclear* (does not count disposal)
- 10.0 Easy Oil (e.g. Saudi)
- 3-6.0 Hard Oil (e.g. Wyoming)
- 7-30 Coal
- 4-34 Wind
- 2-10 Solar Photovoltaic
- 1.5 Ethanol

Major Oil Producers and Consumers

(numbers are millions of barrels per day in 2004)

10.4	Saudi Arabia	20.5	United States
9.3	Russia	6.5	China
8.7	United States	5.4	Japan
4.1	Iran	2.6	Germany
3.8	Mexico	2.6	Russia
3.6	China	2.3	India
3.2	Norway	2.3	Canada
3.1	Canada	2.2	Brazil
2.9	Venezuela	2.1	South Korea
2.8	United Arab Emirates	2.0	France

Oil Related Conflicts: 2006

- Iraq
- Sudan
- Nigeria
- Venezuela
- Central Asia
- South China Sea
- Balochistan in Pakistan
- Other Persian Gulf Countries

Nuclear Weapons Conflicts with Connections to Energy

- **Iran**
- **North Korea**
- **Japan / Taiwan** / a **cascade** in E. Asia

Water Related Conflicts, 2006

- Israel / Palestine (Jordan River Basin)
- Nile River Basin (Egypt, Ethiopia, Sudan)
- Indus River Basin (India, Pakistan, et al.)
- Tigris/Euphrates (Turkey, Iraq, Syria, Iran)

Nile River Basin: Data #1

- 10 countries use Nile water, 8 of which have also been involved in recent wars.

-- Rwanda
-- Burundi
-- D.R. Congo
-- Uganda
-- Kenya
-- Sudan
-- Ethiopia
-- Eritrea
-- Tanzania
-- Egypt

Nile River Basin: Data #2

[Source = CGIAR Challenge Program on Water and Food. CGIAR is an NGO group devoted to agricultural research that includes 57 countries, the UN & World Bank.]

- The present population of this area, 280 million, is expected to grow to 591 million by the year 2025, at an average annual growth rate of 2.5 – 3%. dt =~ 25 years.

- Half the current population is below the international poverty line at $1 per day.

Academic References:

- Resource Wars: the new landscape of global conflict, by Michael Klare, 2001

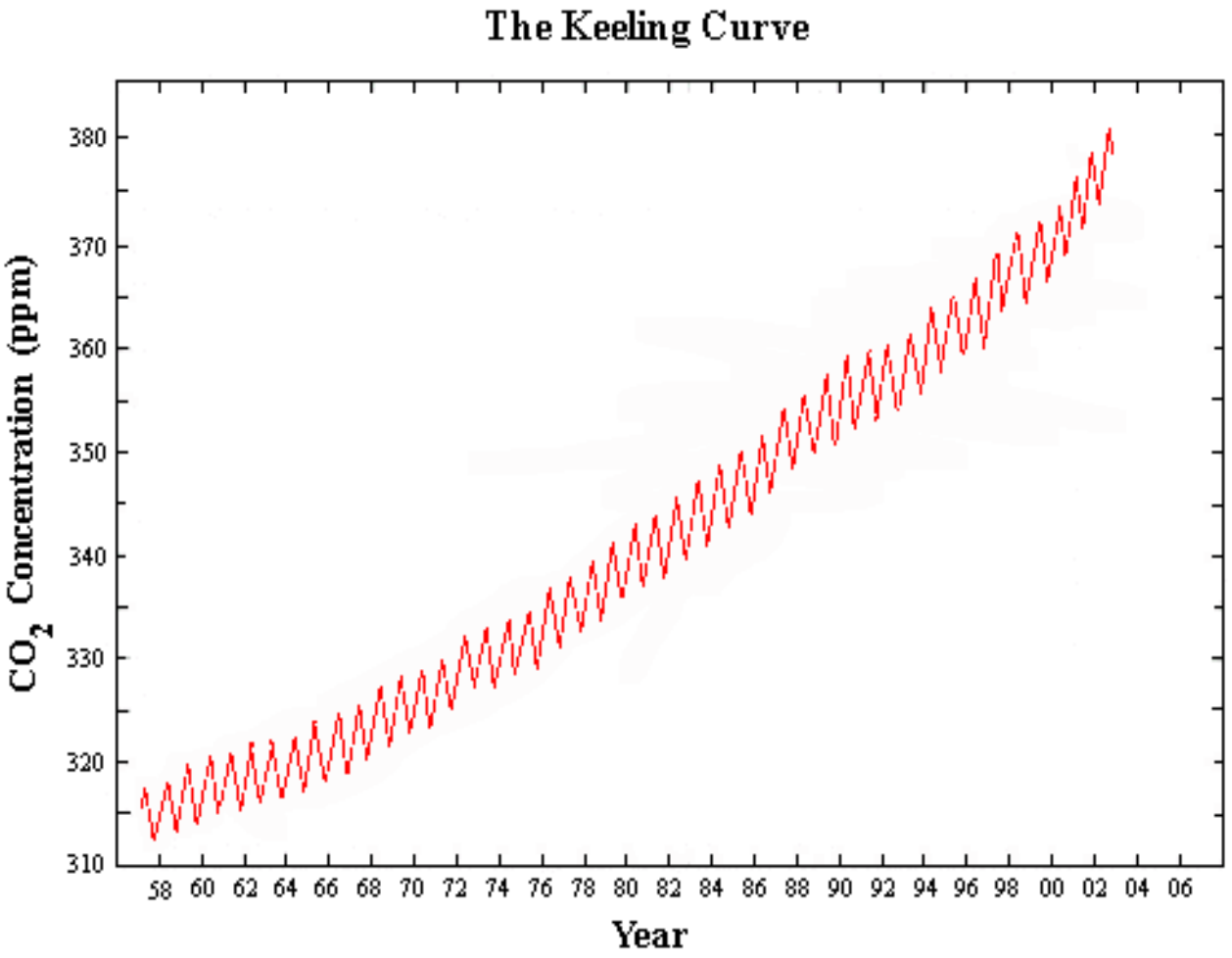
- Environment, Scarcity and Violence, by Thomas Homer-Dixon, 2001.

- Outgrowing the Earth, by Lester Brown, 2004.

Government References:

- The Global 2000 Report to the President (commissioned by Pres. Jimmy Carter)
- Global Trends, 2015, by the CIA (which engaged academics as well as analysts)
- Natural Resources and Violent Conflict, by World Bank Publications, 2003.

Then there's **Global** **Warming**



Unexpected Conflicts

- Several tiny island countries are disturbed that they may **DISSAPEAR** during the next century as oceans rise, and

- Not-so tiny coastal areas like **New Orleans** are bracing for ever more serious storms with hundred billion dollar consequences.

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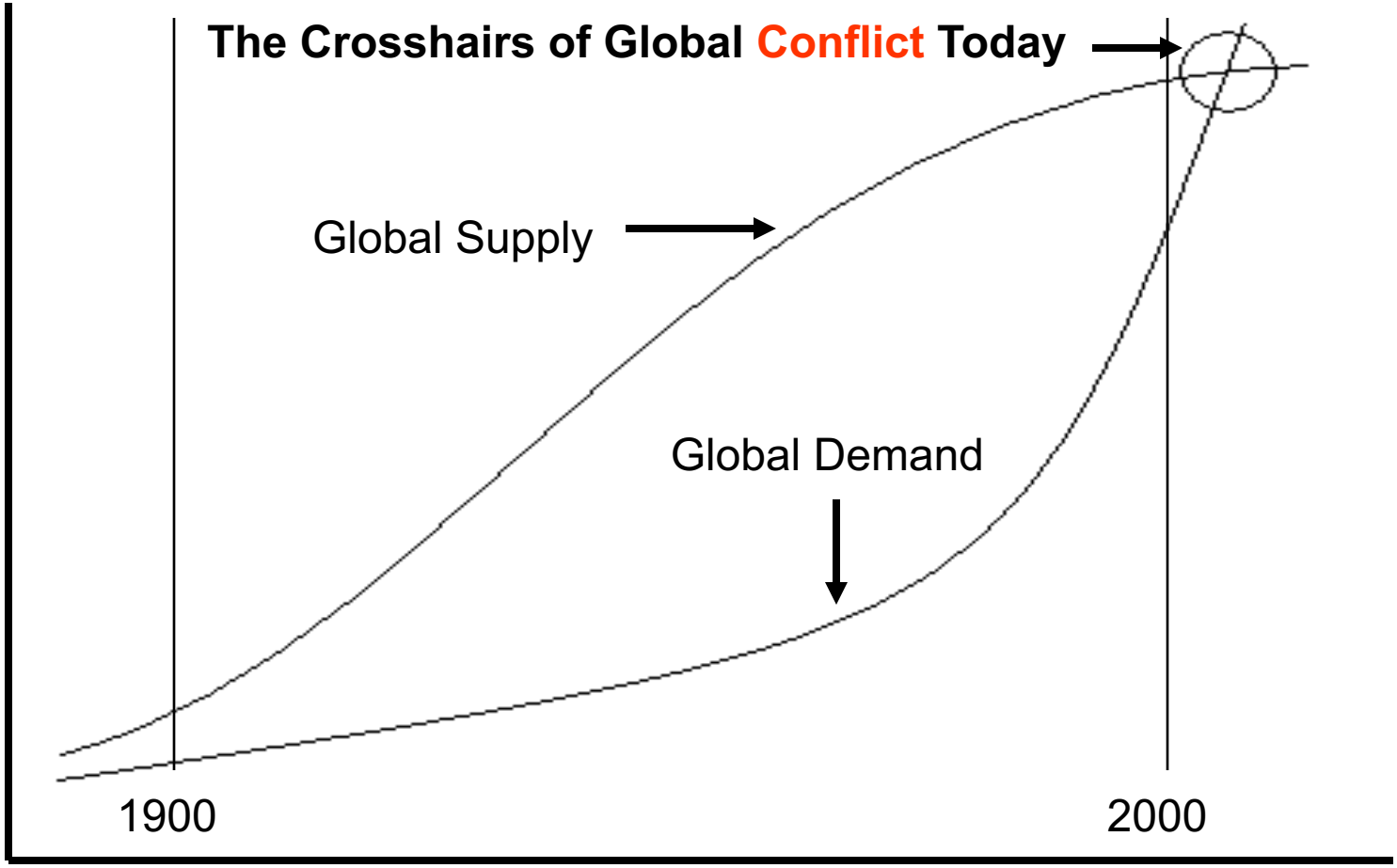

20th Century Global Supply and Demand Curves

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